Energy Efficient Healthy House

DESIGN CRITERIA

SPECIFICATIONS FOR ENERGY EFFICIENT CONSTRUCTION

Prepared for: Health -E-Community

GOALS:

Create a building that ensures a healthy environment for its occupants thereby promoting health for future generations.

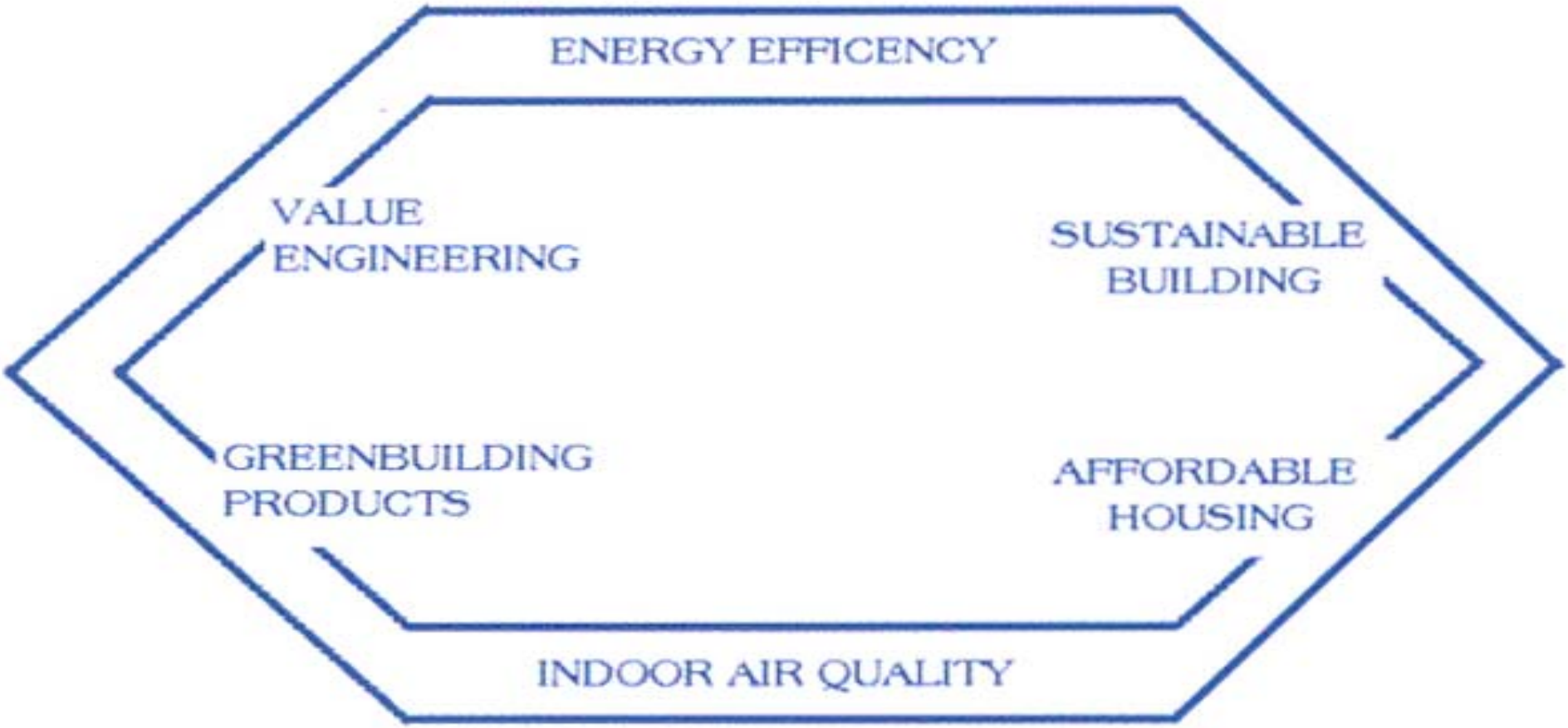
Construct a building that has a high level of comfort and a low total energy consumption during its lifetime.

Construct a building that is durable thereby reducing future waste and depletion of natural resources.

Design project with approaches that the building team can readily understand and adopt without substantially increasing the cost of construction.

Achieve goals while keeping construction costs not greater than 1% of the same model built to the Model Energy Code.

HEALTH -E- COMMUNITY



First Healthy Energy Efficient Homes Now Offered in Affordable Community in Richmond

Health E COMMUNITY — Healthy & Energy Efficient

Building AMERICA

Health-E-Community Enterprise's reputation for the use of innovative technology in the home building industry has led to a collaboration of the Building Science Consortium, American Lung Association of Virginia, Wachovia Bank, Richmond Redevelopment And Housing Authority and Fannie-Mae to design and construct a Health-E-Community. The overall objectives are to successfully integrate optimum value engineering and healthy house technology to provide high levels of comfort/indoor air quality and low energy usage to the entry-level homebuyer. The Building America homes have been designed to save up to 50% of the energy of a similar conventional home, guaranteeing a monthly heating and cooling cost less than a dollar a day, while enhancing indoor air quality substantially.

Health-E-Community Enterprises presents Villages of Fulton, located in Historic Richmond. A community of 89 single family homes that will be the first in the state to offer the support of the U.S. Department of Energy's Building America Program utilizing the state-of-the-art technology for enhanced air quality, energy efficiency and affordability in the entry home market

An approach utilizing proven technology and easily applied build science construction techniques makes it possible to build a new generation of homes that can perform at this level while remaining affordable for the customer. For more information contact Jay Epstein at Health-E-Community Enterprises at Gabriel Enterprises telephone: 1-757-245 7351 ext 304

- Create a building that ensures a healthy environment for its occupants thereby promoting health for future generations.
- Construct a building that has high levels of comfort and low total energy consumption during its lifetime.
- Construct a building that is durable, thereby reducing future waste and depletion of natural resources.
- Construct a subdivision that the building team can readily build to the highest standards of energy efficiency and healthy house technology without substantially increasing the cost of construction.

Energy Value Housing Award
HOUSING AWARD
1997-1999

energy EPA DOE

WACHOVIA

AMERICAN LUNG ASSOCIATION of Virginia

Goals for Health-E-Community Homes

Health-E-Community Enterprises was formed to meet the needs of affordable housing that is both energy efficient and also enhances the indoor air quality of your home. Jay Epstein, President, noticed that there was a gap in the Atlanta market place between energy efficient homes, homes with enhanced indoor air quality and ones that are affordable. In the first half of 2000, Epstein acquired a 33-lot subdivision in Fairburn GA. known as, Fairburn Commons, developed by the Fulton Atlanta Community Action Authority. A construction and development team has been assembled to build homes using the "whole - house" systems engineering approach as members of the Department of Energy's Building America's Building Science Consortium. The construction of the first new affordable single- family energy efficient community in Metro Atlanta is underway.

The Following points are our goals for these new homes and a brief listing of methods and techniques for achieving each.

Energy Efficient / Green Building Techniques

•.Engineered HVAC system to reduce the size of the unit

•.Individual supply damper for balanced heating and cooling

•.Mastic seal of HVAC duck work to limit leakage of air

•.Round Main HVAC supply line vs. rectangular supply lines for better airflow

•.All HVAC individual supply lines at a 45-degree angle to improve air flow

•.All HVAC ductwork and air handler in conditioned area of the house

•.Low E Windows to prevent heat/loss gain through windows

•.Cellulose Insulation treated with boric acid reduces pest infestation and is recyclable

•.Value engineered framing practices to save lumber and forestry products for future generations

•(California corner, open web floor joists, 2by6 exterior wall construction)

•.Stem wall of the foundation insulated to R4 for added insulation value

•.For further information contact Jay Epstein at 1-877-233-8817 ext 304

Enhanced Indoor Air Quality/Sustainable Building practices

•.Fresh air intake into the air handler to bring fresh air into the house

•.Low VOC wood cabinets

•.Low VOC Paints

•.Carpets certified by the Rug Institute (CRI) free of formaldehyde

•.Avantech's " Low VOC sub-flooring

•.Dehumidifier installed in the upstairs hallway to help control relative humidity in the house

•.Transfer grills in each bedroom for balanced heating and cooling

•.Oven exhaust hood vented to the outside to exhaust fumes from cooking

•.Controlling moisture within the monolithic slab and walls to prevent mold and mildew

•.Radon Mitigation by use of a vent pipe from sub- floor through roof of house

High Performance Housing

The Building America Program's System Engineering Approach

Learn from a nationally recognized Building Science expert about energy-efficient, environmentally sound design and construction practices that reduce cost and add value to your residential construction projects.

ABOUT THE TRAINER

Joseph Lstiburek, Ph.d., P. Eng. is a principal of Building Science Corporation. Dr. Lstiburek is an acclaimed public speaker and lecturer in building science. His seminars and presentations on building durability issues are attended by hundreds of architects, engineers, builders, and property managers in the United States each year. He is a forensic engineer who investigates building failures and is internationally recognized as an authority on moisture related building problems and indoor air quality. He regularly consults with the nation's large homebuilders on issues involving warranty problems and new building technologies. He is the principal investigator for Building Science Consortium, one of the four industry team members in the cost-shared U.S. Department of Energy Building America Program. Building Science Corporation is on the leading edge of design for sustainable communities and buildings. They believe in promoting energy efficiency and environmental responsibility within the constraints of marketable and affordable building technology.

Tour the Gabriel Enterprises Building America Demonstration House

DATE & TIME

JANUARY 24, 2002

Workshop: 9:00 AM – 3:00 PM

Tour and Reception: 3:30 PM – 5:30 PM

LOCATION

Peninsula Housing and Builders Association

760 McGuire Place

Newport News, Virginia 23601

AGENDA

INTRODUCTION
- Key concepts to be covered
- Changes to building technology
- The house system concept

RAIN AND GROUND WATER
- Drainage planes
- Brick and stucco
- Synthetic stucco problems

PRESSURES AND MECHANICAL SYSTEMS
- Air pressures in houses
- Wind effects
- Stack effects
- HVAC effects

CONDENSATION DETAILS
- Relative humidity and moisture
- Mold and mildew
- Airtightness of houses and air change

CONSTRUCTION DETAILS
- Building envelope air leakage
- How to find holes
- How to fix the holes you find

MOISTURE
- Putting it all together
- Rain and ground water leakage
- Capillarity and siding/trim problems
- Vapor barriers and air barriers
- Walls, roofs and foundations

CARBON MONOXIDE AND INDOOR AIR QUALITY
- Combustion safety
- Fireplace draft
- Allergy-free housing
- Materials selection
- Exclusion and source control
- Filtration, dilution and ventilation

PROBLEM SOLVING
- Specific problems
- Ice damming
- Comfort/heating bill complaints
- Summary

DETACH FORM TO FAX OR MAIL

PROGRAM REGISTRATION

☐ **Early Registration** *(before January 18)*
and VaHEN Members - **$40**

☐ **Regular Registration - $45**

☐ **Registration Fee enclosed**

☐ **Will pay at the event**

(Registration includes workshop materials and lunch.)

TO REGISTER

MAIL completed form and registration fee to:
VaHEN, P.O. Box 6539, Arlington, VA 22206
(Make check payable to VaHEN)

OR FAX completed form to 703-920-0673 and pay the registration fee at the workshop.

QUESTIONS? Contact VaHEN at 703-486-2966 or osso@mindspring.com.

NAME

ORGANIZATION

ADDRESS

CITY/STATE/ZIP

PHONE/FAX

The workshop is being offered by Virginia Housing and the Environment Network and the U.S. DOE Building America Program. Thanks to Gabriel Enterprises for hosting the tour and reception.

Virginia Housing & the Environment NETWORK

Building AMERICA
U.S. Department of Energy


High Performance
Seminar

Value Engineering


Build America Display House


Flashing for water seal around window


Advanced Framing Technique
“Stacking Effect”


Window Header


Open Webb Joists


Wall Bracing


Header without extra Jacks

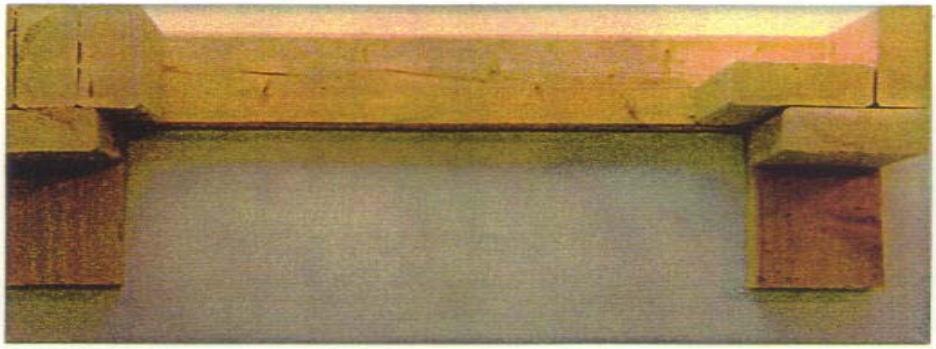
Fire Retardant Cellulose


Interior Framing without duct work in unconditioned attic

Questions To Ask Your Builder

ARE YOU INSULATING ALL THE EXTERIOR WALLS IN MY HOME?

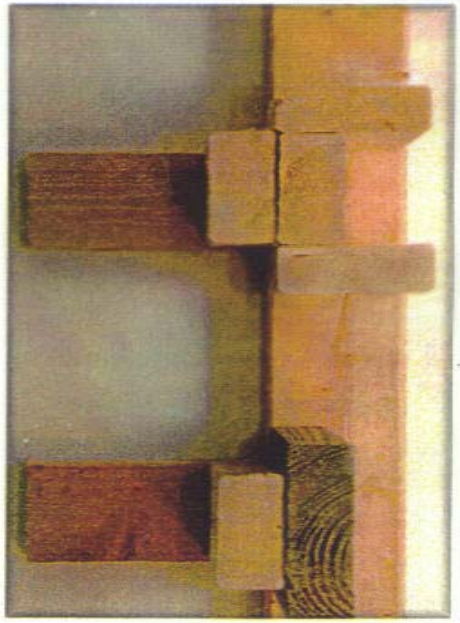
GABRIEL ENTERPRISES



Traditional corners leave 9-10 inches of uninsulated exterior wall in every corner. Typical partition wall intersections with exterior walls leave 6 inches of uninsulated exterior wall. A typical 2,000 square foot home may have the equivalent of (2) bedroom walls uninsulated to the exterior!

THERE IS A BETTER WAY!

We use special framing technologies (the California Corner) to ensure that all exterior walls are insulated.



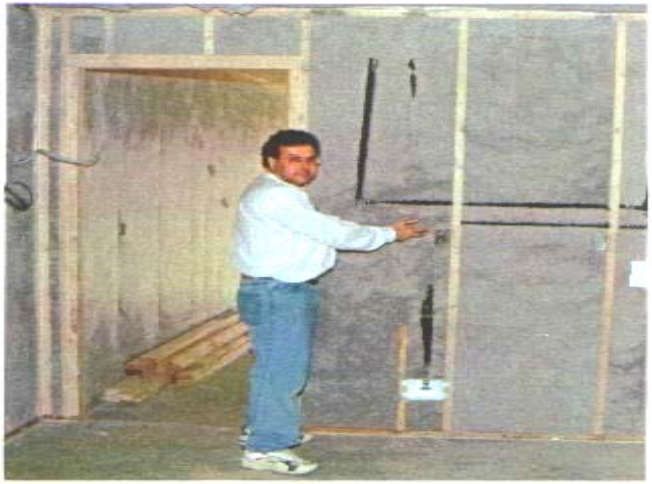
Energy

SAVING THE EARTH, SAVING YOUR MONEY


Open Corner for added
Insulation

DOES CELLULOSE INSULATION REALLY MAKE A DIFFERENCE?

GABRIEL ENTERPRISES



Independent tests have shown that cellulose insulation reduces air infiltration/exfiltration by 38%. Its "custom fit" application encapsulates the pipes and wiring and their penetrations in your home giving you a "true" R-value and minimizing uncomfortable drafts. Because of its hi-density application and thermal mass it is also a great sound barrier. It is a better fire retardant than conventional batt insulation and perhaps best of all, it is non-toxic and environmentally friendly.

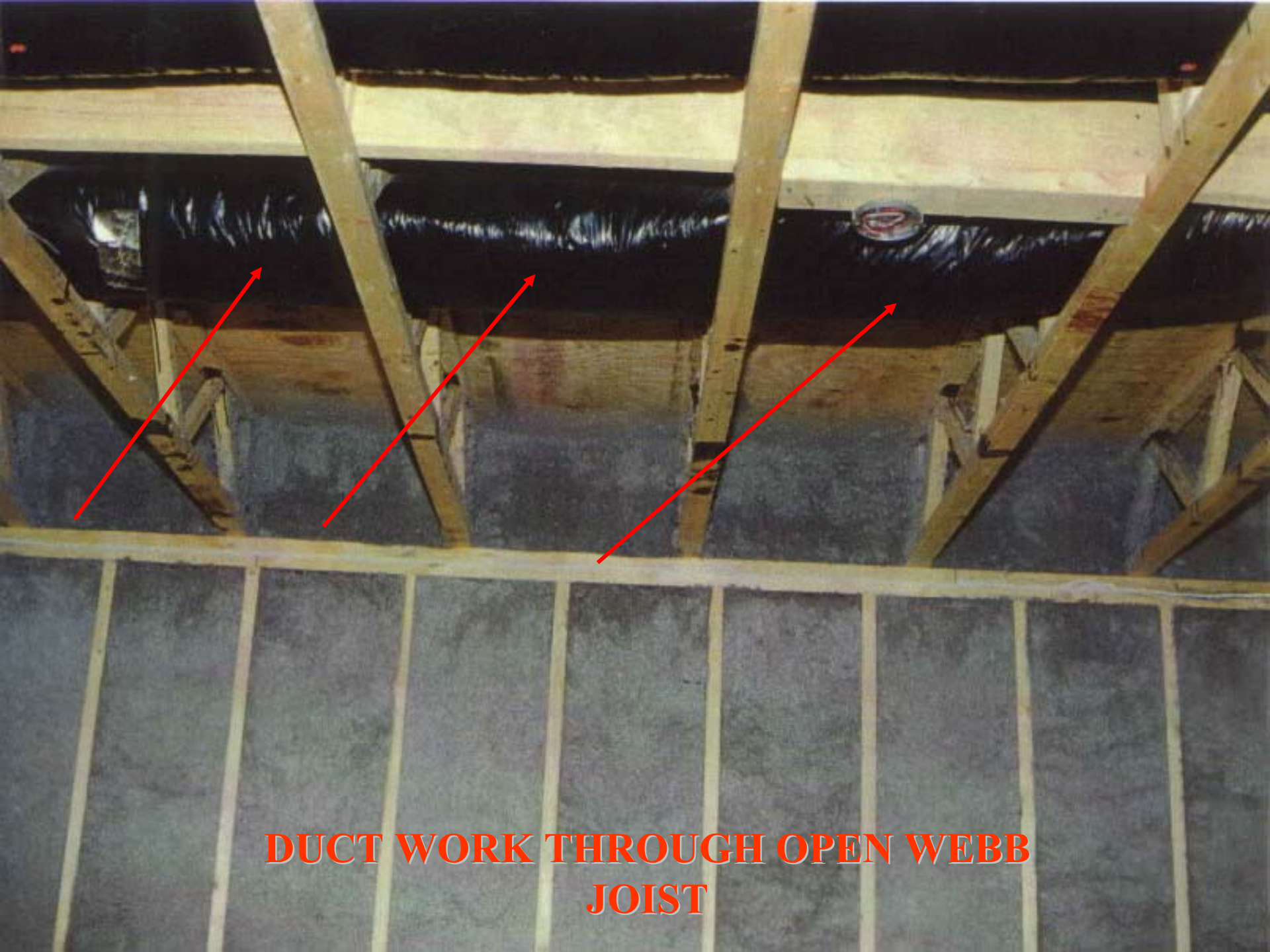

Cellulose
24 inches off Center
2 x 6 Ext. Walls

Is My Duct Work Sealed To Prevent Leakage?

Often homeowners spend a lot of money heating and cooling outside air, attics, and crawlspaces due to leaks and ruptures in duct work. As shown in the photo below, this tape degrades -- often reducing your comfort and raising your energy bills.

THERE'S GOT TO BE A BETTER WAY

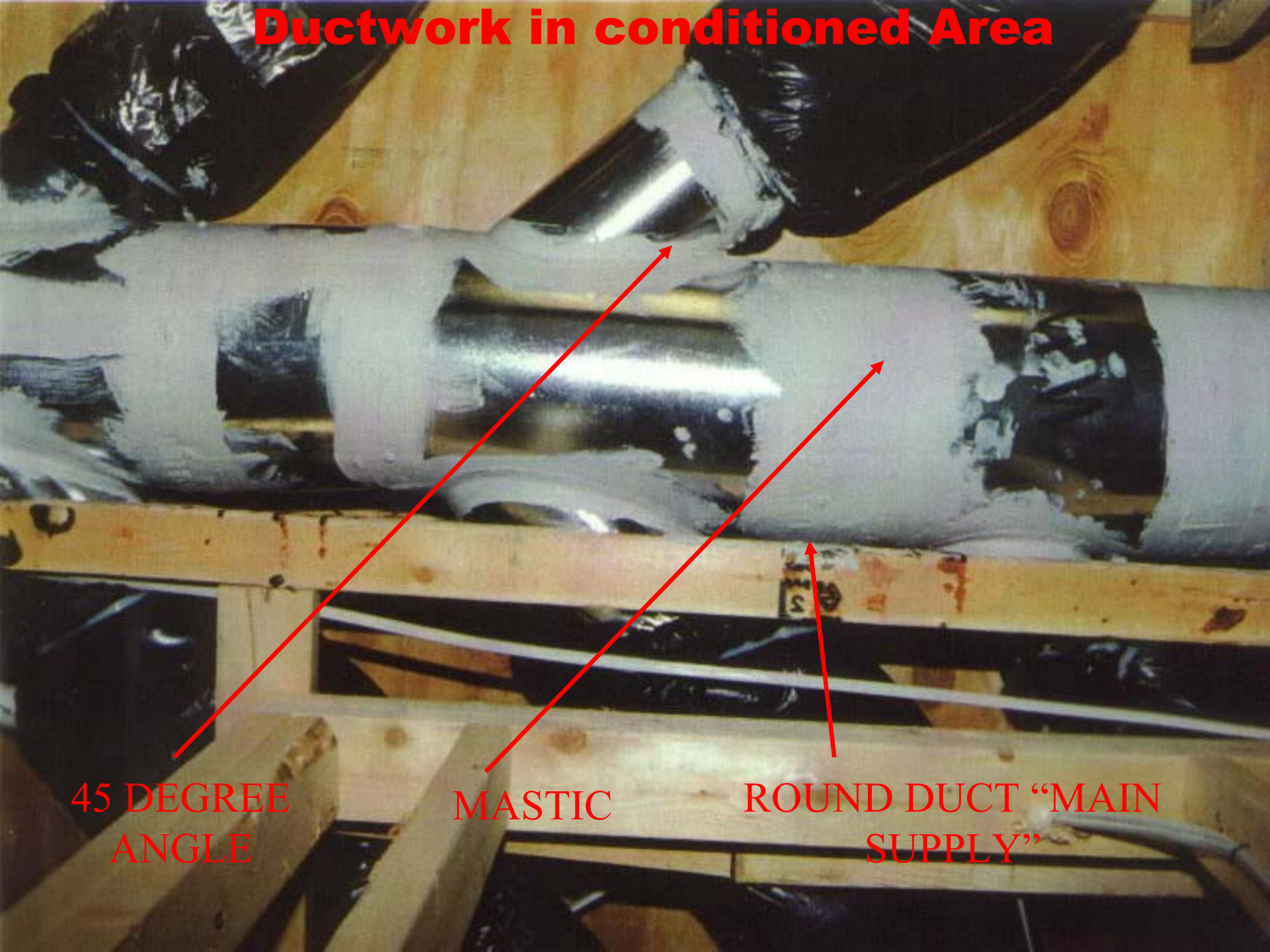
We use a "Comfort Assured Dealer" who seals all duct work with mastic, which sets up like a plaster cast over the duct joints, providing a permanent seal. The duct work is then performance tested for leaking against stringent standards.



DUCT WORK THROUGH OPEN WEBB JOIST


OPEN WEBB JOIST
LOCATE AIR HANDLER IN CONDITIONED
PART OF HOUSE

Ductwork in conditioned Area

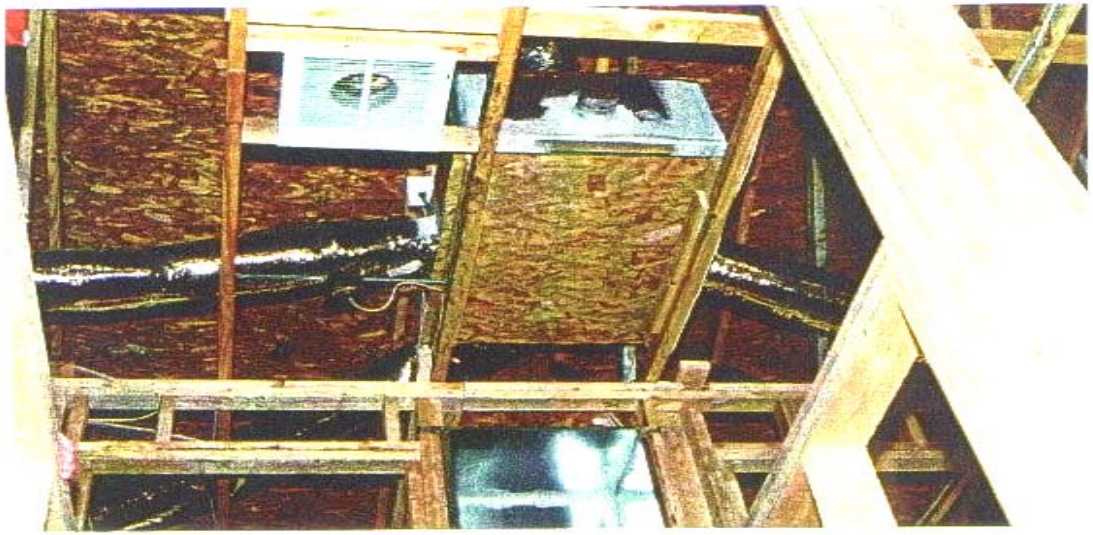


Transfer Grills

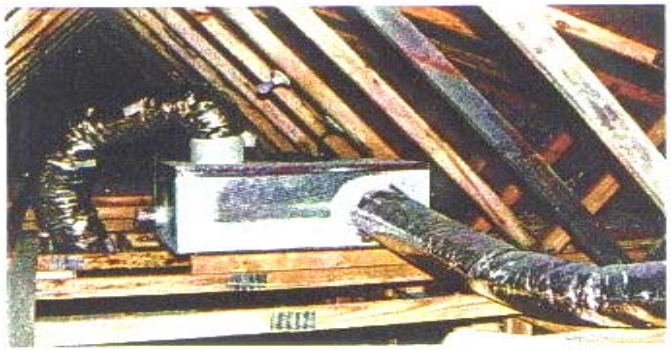
Dehumidifier

BY EMPHASIZING ENERGY EFFICIENT CONSTRUCTION AREN'T YOU CONCERNED THAT YOUR HOMES ARE TOO TIGHT?

GABRIEL ENTERPRISES



Building tight is right. Buildings can never be built too tight. However, they can be under ventilated. Unlike other home builders, we don't rely on uncontrolled house leakage to provide fresh air for our customers. We install mechanical ventilation systems which continuously brings fresh air into the house and mixes it with recirculating interior air in a controlled manner. We also use this system to slightly pressurize the house, which impedes that migration of unwanted pollutants and contaminants into the living environment. This is a major step in assuring your family of enhanced indoor air quality.



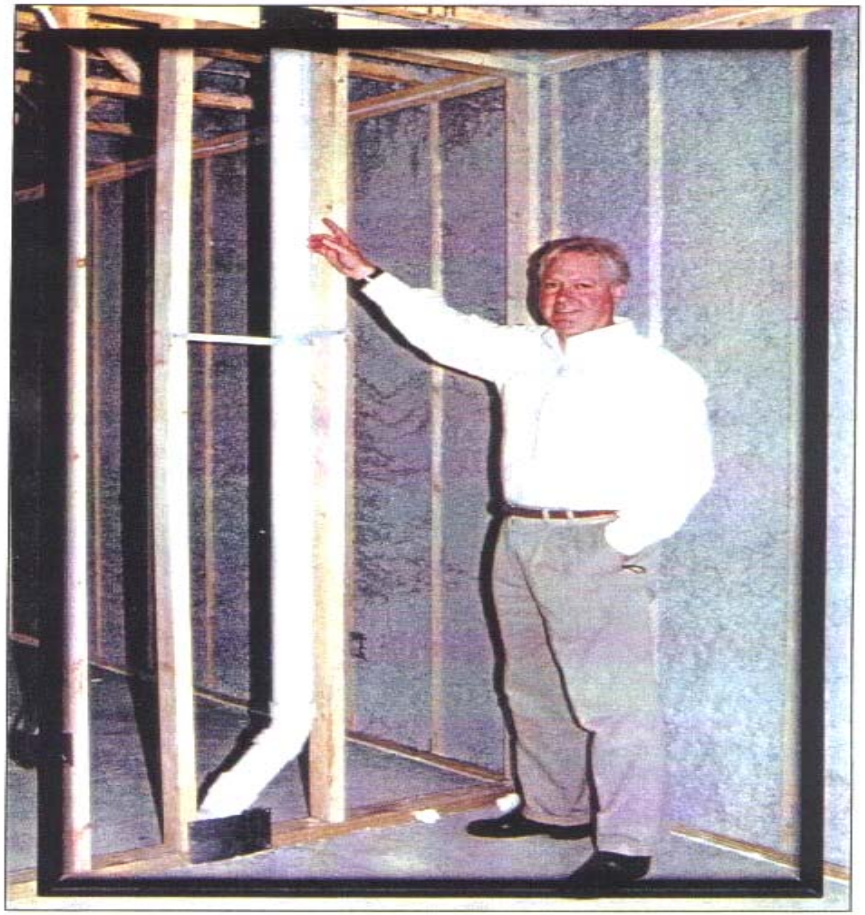
energy


SUPPLY FAN
FRESH AIR SUPPLY
CONDITIONED AIR FROM BEDROOM


Fresh air intake to return side of air handler

How Do We Protect Ourselves From Radon & Other Pollutants?

Radon is the second leading cause of lung cancer, resulting in thousands of deaths each year. Soil gases, such as fertilizers and pesticides used on your lawn, contain harmful pollutants which can enter your home through the foundation in the form of a gas. Our homes utilize either passive "sub-slab depressurization" or active "pressurized crawl spaces" to prevent these harmful pollutants from entering your home. These are permanent, effective solutions to protect the homes' occupants from danger and enhance the quality of indoor air.



WHY DON'T THE HOMES YOU BUILD HAVE VENTS IN THE CRAWL SPACE?

GABRIEL ENTERPRISES

Unvented crawlspaces virtually eliminate moisture problems experienced with conventional crawl spaces. We bring the crawl space into the thermal envelope and essentially convert it into a conditioned shallow basement. The crawl space is now conditioned and dry, winter and summer. We construct the crawlspace so soil contaminants and other pollutants cannot enter the living environment. The home's floors stay warm in the winter and typical crawl space odors are eliminated. Most importantly we eliminate moisture buildup between your home's floors and crawl space. This prevents mold and mildew unlike vented crawl spaces.

WILL YOU GUARANTEE MY HEATING & COOLING COSTS?

GABRIEL ENTERPRISES

This community offers you the **ENGINEERED FOR LIFE™** program. After rigorous testing of the home, the program guarantees your heating and cooling costs at a low monthly average.

ENGINEERED FOR LIFE™ looks at your homes as a system, and how each part of the system affects the home as a whole. Any change can have an impact on the entire system, positive or negative.

THERE IS A BETTER WAY!

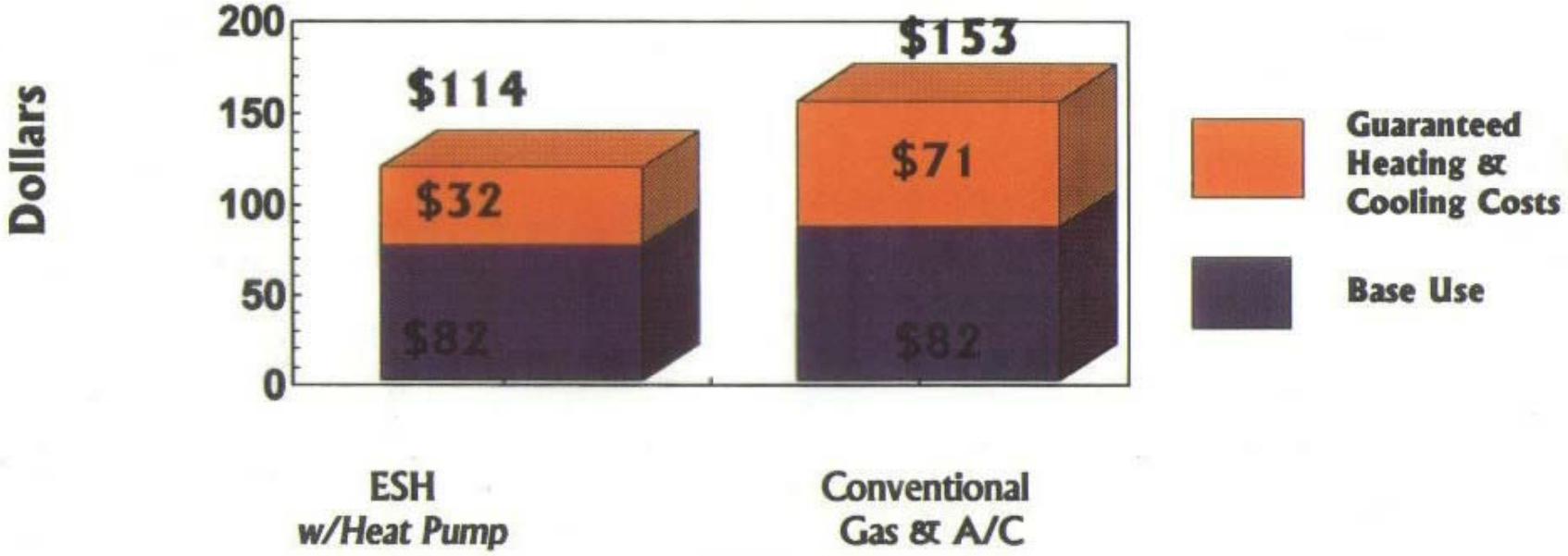
Building with Science for Quality Homes - The resulting benefits to your new home is a more comfortable home engineered for safety and durability.

energy star
SAVING THE EARTH. SAVING YOUR MONEY

The *Health•E* Community Demonstration Home by Gabriel Enterprises, Inc.

Buy Energy Saver Home and SAVE $ 468 Annually!

Projected Monthly Utility Costs w/ Guaranteed Heating & Cooling Costs



*This chart compares the average monthly projected costs for space conditioning between a 10 SEER heat pump and an 80% AFUE gas furnace with 10 SEER air conditioner, based on information provided by the Energy Consortium. This chart assumes a Virginia Power rate of $0.0915/kWh in the summer and $0.06104/kWh in the winter, with a natural gas rate of $.858/therm. Actual buyer's heating and cooling costs may vary depending on the number of occupants, thermostat settings and lifestyles.

Marketing


Traditional House Appeal


Wood Cabinets


Heats and Cools for
less than a dollar a day


Saves up to $40 a month in utility cost

Enhanced Indoor Air Quality


Built To Last